ICAO AIS-to-AIM Study Group

AMDB Use in Industry

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## Agenda

- **What is an AMDB?**
- **Why do we use them? And How?**
- **Perspectives**
Agenda

• What is an AMDB?

• Why do we use them? And How?

• Perspectives
What is an AMDB?

- AMDBs represent a collection of aerodrome information that is organized and arranged for ease of electronic storage and retrieval in systems that support aerodrome surface movements, training, charting, and planning.
Airport Mapping DB Content - Features

Focus on Runway Area

- Arrest Gear Location
- Exitline
- Threshold
- Runway Marking
- Centerline
- LAHSO
- Runway Intersection
- Taxiway Holding Position
- Taxiway Guidance Line
- Taxiway Intersection Marking
Airport Mapping DB Attribution

[Diagram of airport mapping with a database query interface]
AMDB Production Process
Basic Process for Capturing Airport Mapping Databases

**Step 1**
Capture High Resolution Satellite Imagery & Ground Control

**Step 2**
Develop Vector Features and Attributes

**Step 3**
Extract Airport Map for Onboard Use
ICAO SARPS

DO-272B/ED-99B

User Requirements for AMDB

ARINC 816

DO-291A/ED-119A

Ground Implementation

Avionics Implementation

- ARINC 816-2 targeted for end 2011

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Direct contract between airline and selected DB provider thanks to a 100% supplier-independent DB chain
Agenda

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- Why do we use them? And How?

- Perspectives
Reasons for AMDB - Safety Concerns

*Low visibility*

- Reflection in the rain at night
- Dazzling effects of the sun

*Current works at airports*
Reasons for AMDB - Safety Concerns
Reasons for AMDB - Safety Concerns

Abundance of marking, lights & signs

1. Taxiway Location Sign
2. Holding Position Sign
3. ILS Critical Area Boundary Sign
4. ILS Holding Position Sign
5. Runway Safety Area/OFZ and Runway Approach Area Boundary Sign
6. Taxiway Location Sign-Optional, depending on operational need
7. Holding Position Sign for Approach Areas

150’ wide taxiway shown to illustrate orientation of signs on both sides at holding positions.
Reasons for AMDB - Safety Concerns

Relation between Outside marking & Map
AMDB Use – Current Status

• Airport Moving Map is a reality!

  • Jeppesen AMM (Airport Moving Map) integrated in EFB for Boeing 737 and 777 aircraft
  • Airbus OANS (On-board Airport Navigation System) certified on A380: used by Singapore Airlines since October 2007
  • Boeing will also propose an integrated forward-facing moving map on 787
  • Airbus OANS development launched for SA/LR aircraft: certification planned for 2012
Airport Moving Map: Airbus A380 Solution

A380 OANS Integration in Cockpit

Independent display on ND

Activation + mode/range selection on EFIS Control Panel

Move, selection, text using Cursor Keyboard device
AMDB Use – Boeing Status

Integration in Boeing 737

Independent on-side displays

Integration in Boeing 777

Mode/Range, Move, selection using Line Selectable Keys or Touchscreen

AMDB are also integrated in forward-facing display on Boeing 787
AMM Safety Gains – Positional Awareness

Display modes can be selected at pilot’s discretion

ARC Mode

ROSE-NAV Mode

North-up (PLAN) Mode
AMDB Use – Display Ranges

Ranges can be set with regards to intended use

1000 ft
Decluttering adapts map

Pilot can focus his/her attention on significant map items
AMDB Use – Runway Incursion

• Runway Incursion Occurrences
  • 168 runway incursions in years 2003-2005 in US
  • 350 runway incursions in year 2002 in Europe
  • Severe accidents were related to runway incursions

• AMM Solutions
  • Specific identification of runways
AMDB Use – Runway Incursion

• Visual advisories could also be presented
AMDB Use – New Functions

- AMDB is used to support Runway end Overrun Warning (ROW) and Runway end Overrun Protection (ROP)

- Brake-To-Vacate function also enables to adapt braking following an exit selection
AMDB Use – Gate Awareness

- Specific depiction for
  - Stand guidance lines
  - Terminal buildings, gates, and related labels

- Possibility to search any element and perform actions
  - Annotate
  - Center on element
AMDB Use - Graphical SNOWTAM encoding

Image of an AMDB interface for SNOWTAM encoding, showing a map with various runways and taxiways, and an input form for surface contamination details.
Agenda

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Potential Future Surface Applications
Potential Future Surface Applications

**Alerts:**
- Runway Incursion/Excursion prevention
- A/C performances on runways, clearance deviation

**Braking / Acceleration Cues**

**Surface Traffic:**
- Display,
- Indications,
- Alerts

**Surface Navigation**

**Taxi Path:**
- Display,
- Revision,
- Exchange via datalink

**Taxi Guidance**

**Airport Management Tool for airlines and airports:**
- Digital briefing,
- Aircraft restrictions,
- Other airline applications...

**AIS & MET Integration:**
- Graphical NOTAM display,
- MET information display

**Vision Systems:**
- 3D Display

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Extended data use - Airport DataBases Example

What could be Surface Operations in the coming years?

What will be needed for Surface Operations in the coming years?

- Temporality
- Connectivity
- Higher accuracy
- Higher integrity

These needs are common to many actors (airlines, general aviation, aircraft manufacturers, data providers, airport operators, ANSP)

=> DB standards upgrades are in progress towards this objective
Any Questions?